Congenital Heart Disease, Complex

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TCT-164

Is Amplatzer Duct Occluder II Ideal for Closure of Congenital Gerbode's Defect?

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Background: Gerbode defects are rare (0.08%), congenital left ventricular to right atrial communications. The congenital syndrome of left ventricular-right atrial communication was first described by Thurman in 1838. The advent of echocardiography, particularly color Doppler imaging, has improved the noninvasive diagnosis of intracardiac shunts. They are traditionally closed surgically with high incidence of complete heart block. But there are no reports of congenital left ventricular-right atrial shunts closed by devices. For the first time we are report a small series of six cases of Gerbode's defect closed by Amplatzer Duct Occluder II. Aim of our study is to assess the feasibility, efficacy of trans catheter closure of Gerbode's defect by Amplatzer Duct Occluder II.
Methods: Six consecutive cases of Gerdode defect, age ranging from 10 months to 13 years formed the material. The weight ranged from 6.5 kgs to 34 kgs. The size of the defect ranged from 4 to 6 mm on transthoracic echocardiography (TTE).
Results: The left ventricular angiogram done in AP, RAO view with 10 0 cranial angulation illustrated the contrast from LV opacifying the right atrium (RA). The defect was crossed by over the wire technique by 0.0 25" Terumo guide wire through the retrograde approach from aorta. 4F Cooks Shuttle sheath was passed over the guide wire. The distal retention skirt was released in RA and the whole system was pulled under fluoroscopy and TTE guidance. The devices were deployed in all the patients by releasing the middle lobe at the defect and the proximal disc in LV. The defects were successfully closed with various sizes of ADO II 4X6 in 2 cases,3X4, 5X4,6X6 in one case each. Only one patient had transient complete heart block needing temporary pacing for 48 hours and steroids for five days. He made a complete recovery. The fluoroscopic time was 6.2 +1.4 min. No tricuspid regurgitation or residual shunt in any of the patients on
Conclusions: ADO II is safe, effective and an attractive alternative to surgical closure of Gerbode defects.ADO II is ideal for closure as the success rate is very high with very low complication rate and on short-term follow-up results are favourable.

TCT-165

Transcatheter pulmonary valve replacement with the Edwards-Sapien Valve: The Toronto Congenital Cardiac Centre for Adults Experience

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Background: Percutaneous pulmonary valve implantation (PPVI) has emerged as a viable alternative to surgery in patients with right ventricular outflow tract (RVOT) dysfunction. Limited data is available for the Sapien (Edwards Lifesciences, Irvine CA) valve in this setting.
Methods: Retrospective analysis of all patients to have undergone PPVI using the Sapien valve at a large quaternary centre. Continuous variables presented as mean-±standard deviation, categorical as percentages. Comparisons between means are made using the t-test.
Results: 23 patients (74% male, mean age 34±9.2 years) were identified. Mean pre-procedure NYHA class was 2.5±0.7 and maximum VO2 was 18±6ml/kg/min (53 ± 11% predicted). Primary diagnosis was: Tetralogy of Fallot (n=13), Ross procedure (n=5), PA/IVS (n=2), DORV/Rastelli (n=1), ccTGA (n=1), PS (n=1). RVOT characteristics included: homograft (n=9), bioprosthesis (n=7), valved conduit (n=5), failed Melody valve within a homograft (n=2). Nature of conduit dysfunction was: stenosis (n=8), regurgitation (n=6) or combined stenosis/regurgitation (n=9). Technical success was 96%. One patient required elective surgical pulmonary valve replacement for a high residual gradient. Pre-stenting was performed in all. Valve sizes were 23mm (n=8), 26mm (n=14) and 29mm (n=1). Procedural haemodynamics revealed a decrease in the mean RV-to-systemic pressure ratio from 0.64 to 0.36 ($p< 0.001$) and RV-to-PA gradient from 39 to 9mmHg ($p< 0.001$). At a mean follow-up of 3.6±2.1 years (range 0.5-7.2 years), there were no deaths and no endocarditis episodes. One patient required re-intervention (no PR immediately post procedure but severe valvar PR at one year requiring a valve in valve procedure). 74% were NYHA class 1 (mean1.2±0.5) and the mean VO2 max was 19±6ml/kg/min (60±13 % predicted, p=0.09 compared to pre-procedure). There was preserved valve function during serial follow up (no change in the RVSP (mean 50±9mmHg, p=0.78) nor PV peak gradient (mean 25±10mmHg, p=0.22) compared to initial post procedure echocardiogram). Pulmonary regurgitation was trace in 82% and mild in 14% by echocardiography.
Conclusions: The Edwards Sapien valve is a viable and durable option for PPVI in this single centre study.

TCT-166

Stenting the Right Ventricular Outflow Tract as a Palliative Procedure in Patients with Tetralogy of Fallot

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Background: Neonates and infants with Tetralogy of Fallot (TOF) may occasionally need a BTT shunt to treat hypoxemia. However it may distort the anatomy of the pulmonary arteries (PAs). We report the outcomes after stenting the right ventricular outflow tract (RVOT) as an alternative procedure to temporarily improve pulmonary blood flow.
Methods: From January 2010, stenting the RVOT was offered as an alternative procedure to BTT shunt. The procedure was performed under general endotracheal anesthesia. One or more coronary or peripheral stents (4-8 mm in diameter) were implanted in the RVOT across the pulmonary valve annulus using 4-6 F catheters. Pre-dilation was performed according to the operator preference. Nor or epinephrine infusion was used during the procedure as appropriate. Technical success, procedural complications, hypoxemia control and feasibility of surgical repair were all outcomes parameters.
Results: Nine patients (median age and weight: 3 months and 5 kgs (1.5-10), respectively) underwent the procedure. One patient had complete AVSD, one had previous BTT shunt and another had Alagille syndrome. Three underwent concomitant procedures (PA angioplasty and balloon aortic valvuloplasty). All stents were implanted in the intended location with significant improvement in the systemic arterial saturations from 70±8 to 82±5% ($p< 0.05$) and no procedural complications. In one 3 month-old premie (1.5 kgs), the procedure allowed for PGs discontinuation. Moderate to severe PI was observed in all patients. One with Alagille syndrome, aortic stenosis and hypertrophic cardiomyopathy had intractable CHF and died of sepsis 2 weeks afterwards. Another infant died at another center 6 months afterwards due to intractable hypoxemia. In the remaining 7 patients, peak systolic gradient by echo was a median of 55 mmHg (30-70) before surgical repair, which was performed uneventfully 2-90 days after the percutaneous procedure. The previously implanted stents were easily removed at the operation.
Conclusions: In this initial experience, stenting the RVOT was feasible, safe and effective in the short-term. Continuous and close monitoring should be performed and definitive surgical repair should not be delayed.

TCT-167

Coarctation Stenting Through the Carotid Approach in Neonates and Infants

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Background: Coarctation of the aorta (CoA) may present with congestive heart failure (CHF) in the neonate and infant. Balloon angioplasty is generally ineffective due to high rates of restenosis. We report mid-term outcomes after CoA stenting through the carotid artery (CA) in this age group.
Methods: CoA stenting was performed under endotracheal general anesthesia. The common CA was dissected out by the CV surgeon and a 4-7F sheath placed under direct vision. Stents that could be dilated up to the adult aorta size were mounted on 5-9 mm balloons. Stents were not crossed after delivery. The CA was repaired at the end of the procedure with 8.0 prolene individual sutures. Doppler ultra-sound was used to assess CA patency during follow-up.
Results: From 0/07, 20 pts (median age and weight: 4.5 months and 5.3 kgs, respectively) underwent the procedure. Ten had native and 10 recurrent CoA. Eleven had isolated CoA and 9 had CoA associated with complex CHD such as TGA, interrupted aortic arch and univentricular hearts. LV dysfunction was present in 11 pts requiring intravenous inotropes in 6. In all pts stents were implanted in the intended location with diameter increase from 2.4 ± 0.8 to 6.5 ± 1.2 mm ($p< 0.001$). There were no complications. The CA was repaired uneventfully. CHF was controlled in 19/20 patients, which resulted in discontinuation of inotropes. The echo gradient fell from 38 ± 12 to 8 ± 7 mmHg ($p < 0.001$). CA Doppler performed in 10 patients showed normal findings. In a median follow up of 2 years, all patients were clinically well, with normal blood pressure and distal pulses. Three pts underwent reinterventions (2 patients: new stents, one for aneurysm formation and the other for neointimal proliferation; and 1 redilation to adjust for somatic growth), 1 underwent a hybrid reintervention (stent dilation + intracardiac repair) and 2 underwent surgical repair of complex CHD. There were 2 deaths after surgery.